In Sickness | April 27, 2018

PAGING DR. MARIO

When my mother was young, her mother was in a car accident. She spent the last two years of her life in a coma. My grandfather paid the bill. In cash. Was it expensive? Kind of. In the way that gas prices sometimes feel out of control. But if you cut back on your food budget and other living expenses, you can afford 24-hour hospital care.

In 1951, the state of Oregon made the self-pumping of gasoline a crime ("the dispensing of class 1 flammable liquids" or some such jargon). It's not a frequently punished crime, although I occasionally hear a story about fines and jail time. Those reports always sound like urban legends. "Three years in the slamma' just for pumpin' his own gas!", I'm told. And I wonder: who does it hurt? With a punishment that severe, there should be a victim. Whenever I get online to verify those legends, I see accounts like that of Steven Mapes. And I see his picture. And I assume there's more to the story. Still, in Oregon, one can be penalized for pumping gas. Unless you're being paid to do it.

That's where I grew up. And it's where I got my first, second, and third driver's licenses. But I've also lived in Indiana, Illinois, Connecticut, and California. In each of those states, I appeared to be an out-of-towner. "He's sure far from home" or "that's quite a road trip", I imagine other drivers occasionally said while pointing at my license plate.

Every time that plate made it back home, I was relieved. Because it's a hassle to pump my own gas. I always have the same series of thoughts: "Why is every button punctured? How hard are people poking them? Shoot, did I ever complete my hepatitis vaccination?" I don't have hand sanitizer in my car, so I use my knuckles to enter my PIN or zip code, inflicting some more damage to the buttons. And I revisit my wish that the whole country were Oregon. How convenient it would be if its borders circled the globe. Because it's nice when someone else does the work for you.

I take that same constitution to the grocery store, and I avoid the self-checkout aisles. There's an employee who will do it for me. For free. So why would I bother weighing my own produce and looking up item numbers and holding the bar codes just right and bagging everything according to the computer's instruction? The worker doesn't even expect a tip. The only problem I have with the staffed checkout aisle is the question, "Did you find everything okay?"

Of course I did. That's why I'm checking out. If I were missing something, I wouldn't be here. I'd be pushing my cart around looking for it. Could the layout of the store be more conducive to my shopping patterns? Sure. Would it be helpful for me to relay that information to you, who has no control over the placement or presentation of inventory? No. I'm sure a lot of thought (and probably some algorithms) determined the placement of everything I deem unintuitive or inconvenient. And reorganizing it to cater to my

personal shopping patterns would probably breach contracts with suppliers. So why would I bother to outline my reorientation plan to the teenager scanning my egg carton and weighing my celery?

"Did you find everything okay?"

"Mmhmm", while bobbing my head in the direction of yes.

With medical appointments, I've found myself *wanting* to be asked that question. Or at least what that question implies: "Are you satisfied with your experience and if not, what can we do to improve it?" And, of course, I'm never asked. Because it actually matters. If it mattered in the grocery store – if there was something they were capable of doing to address your concern – they'd stop asking too, dreading the hassle your answer would create for them.

In the clinic, the orientation is *disorienting* to most patients. It's unintuitive, uncaring, and generally unhelpful. Because it's not set up for them; it's set up for the employees. Patients are just customers with nowhere else to shop. You won't lose their business by providing suboptimal care. While providing *optimal* care would drastically reduce the wealth of the physician and clinic alike.

If this sounds like the ravings of a frustrated patient, just bear with me. I'll explain what I mean by suboptimal care. And then I'll describe what optimal care looks like. And by the end, the points I'm making should not just seem unemotional, but obvious.

Suboptimal Care

Doctors don't know much about the body. I'm not denying *intelligence*. Most of them are extremely knowledgeable about the practice of healthcare. But that has profoundly little to do with biology, physiology, biochemistry, and so on. Physicians know the names and pronunciations of innumerable diseases and drugs. What tests to order. Which treatments to prescribe based on test results and presentations of symptoms. They know doses, durations, odds of success. They know when to refer. And how to document everything for the sakes of billing and liability. All of this is complicated. All of it requires intelligence. But none of it requires knowledge about human bodies. Each of these functions can be performed without the tiniest understanding of biology, for example. Even if they knew the name of *every* illness and *every* medication, that still wouldn't require any expertise in the natural sciences.

By way of comparison, if you can name a thousand musicians and categorize them into their respective genres, that doesn't mean you know anything about *music*.

"Get me out of the bridge with a solo in A7. It's a 6-2-5-1 structure, but the timing is a bit weird; it's like 7½ bars of hustled ragtime. You'll see what I mean when you hear it. Just don't make it sound too bluesy. Ready?"

Real musicians – those with a firm grasp on music theory and composition – can perform in that situation. If you can merely name every band ever, and categorize them by genre, then this is outside of your scope. In the *music theory* portion of medicine, doctors lack proficiency. They can't give you the solo because they can't really play the instrument. Because that's not the job. Just as it's not the studio musician's job to know what a music historian knows. Or what a studio executive knows. Or in what genre to file Backstreet Boys.

So what happens if your condition is uncommon? It's not a presentation of symptoms the physician has seen before. Or the pattern of test results is unfamiliar. What happens when something about your case is atypical?

"Then I get referred."

It can take a while to be seen by a specialist. I've seen a lot of them; I've experienced the wait times. For me, on average, it's four to six months in the queue. I wait in line, month after month, until my appoint time eventually arrives. And it lasts ten minutes. And if my case isn't something *they've* seen before, I get another referral. "But we'll expedite this one. Hopefully we can get you scheduled within two months." And on and on. And on. And on. A year later, I'm finally evaluated by someone who *can* diagnose me. Not through his or her deep knowledge of physiology, but by simple pattern recognition: this is a pattern they know. Granted, over the course of the year, my health has deteriorated greatly. Had someone been capable of rapid diagnosis, my life would be incomparably better. And my bank account would have saved $20,000. And my insurance would have saved more than $1,000,000.

You can see how this system isn't optimal.

"Are you saying biologists, physiologists, and biochemists should be performing this job?"

No. They don't know the patterns. I'm saying *computers* should. Which brings us to:

Optimal Care

In 1997, IBM's Deep Blue computer program beat Garry Kasparov in chess (3½ to 2½ in a six-game match). And then, for some reason, IBM quickly dismantled the system. I'm not sure what the point of that was.

Today, the free chess programs you can play on your phone are essentially unbeatable. Similarly, a cheap app – much less complicated than Deep Blue, let alone FitBit or Uber – could beat the greatest grandmaster of physicians in a diagnostic duel 100% of the time. There's no way any doctor who has ever lived could stand a chance when competing with the medical equivalent of Angry Birds. And it would only cost a few cents of electricity. The truth here is difficult to deny. And I don't think anyone is attempting such a denial. Despite this, in 2018, sick Americans seeking help must visit a great ape in a white coat who knows surprisingly little about the body, and whose foremost interest is racking up

billing codes. Day after day, death after death, we file for bankruptcy while we grieve the passing of our loved ones. Because medicine failed us. And still charged us.

That is a system it would make sense to dismantle.

But we don't.

Why?

The answer seems to be that the business of medicine is not about "healing people"; it's about billing them.

When you buy a salad, you're not buying "health"; you're buying vegetables. Similarly, when a patient "visits" (even that word is misleading) the doctor, the restoration of health is what they think they're buying. That's not what's being sold. The improvement of health is not part of the contract. The doctors' brief presence is all that you're buying. And that doctor doesn't have time to perform critical and creative thinking. All they're capable of in a double-booked fifteen-minute appointment is automation. And humans aren't good automatons. Computers are. For diagnostic medicine, doctors are just bad computers.

So I wonder if the future of the clinic will be similar to the current grocery store. If you can't do the self-checkout (six stations monitored by one physician), you'll go through the individual checkout line where the clerk (sorry, doctor; they'll still insist that you call them that) will push the buttons for you. And bag your prescriptions. Maybe the bagboy will be a different employee; the hierarchy will probably stay intact.

"What about surgery? I don't trust Wall-E to cut out my appendix."

Fine. Let's let humans do that part for now. And let's keep human hands holding our steering wheels for the time being, too. There are some domains of life in which robots remain inferior. One of those domains is *not* diagnosis and the dispensing of wisdom. We should already be using the self-checkout aisle for this. Depending on your license plate, of course. In Oregon, I wouldn't be surprised if pushing your own buttons (and then wondering why they're all punctured) were illegal. Unless you're a paid attendant. And news stories like that of Steven Mapes would occasionally remind us of the crime.

For everyone else, as they leave the self-checkout medical station, they'll be pointlessly asked, "Did you find everything okay?"

The answer will still be no. But for reasons that don't seem reasonable today. If there's one superhuman trait we all share, it's our capacity to grow accustomed to life's luxuries instantly. Those three minutes spent waiting in the diagnostic checkout aisle will produce at least one sigh of exasperation. And the price! My god, the price! It's as bad as diesel at the 76 station!

Let's say today's healthcare system offered you a choice in whom you want to "visit".

Option 1: a fallible human being whose understanding of biology is obsolete, didn't know all that much in the first place, is biased by background and experience, didn't sleep well last night, is distracted by relationship stress, and is double-booked and behind schedule.

Option 2: a machine that knows everything that's ever been known, and will generate its diagnosis in less than a second. It's possible that a human could *match* the accuracy of that diagnosis, if they come to the same conclusion, but no human can *beat* it.

Which would you like to see?

I think everyone would choose the latter… which is the reason it is not offered. It would threaten the preservation of the status quo, risking the wealth of the physician. Clearly, that's more important than the health of the patient.

"What about bedside manner? Do you think a robot can sympathize with our sufferings?"

That's not the reason we go to the hospital. The kissing of boo-boos, the serving of soup: we have mothers to perform those roles. Mothers and other loved ones.

Pretending to suffer alongside me for six to eight minutes while failing to cure me isn't what I would call "optimal medicine". We can do better. We could have done better when Backstreet Boys were at the peak of their popularity.

"But if you automate medicine, where does it end?! Do you want the whole world to be a lonely, digitized abyss, devoid of human intimacy?"

No. I think most jobs are not merely *enhanced* by human workers; they *require* them. Which brings us to:

The Limits of Automation

In most jobs, human interaction enhances my experience. Whether it's a grocery store or a gas station, I prefer to have the menial labor done for me. Even if it's unnecessary, it's still nice. Because it reminds me that I'm part of a community. I'm not living in a post-apocalyptic world. If those jobs could all be done by an XB-500 (Rosie from *The Jetsons*), I would still want human beings doing them. Orbit City strikes me as a hub of sadness. I think lots of people agree. Because we still play chess. Despite Deep Blue revealing the pointlessness of human play. And we still watch the Olympics. A Model T could exceed 40mph, but the world cheered for Usain Bolt. And everyone old enough to use a phone detests automated services. "Speak to a representative!", I enunciate clearly, hoping it might serve as a password to circumvent all the robotic nonsense.

Outside of critical areas such as human health, I don't suspect we'll be handing the entirety of civilization over to Rosie and her colleagues any time soon. Maybe I'm wrong, and everyone else *can't wait* to take Lectronimo for a walk. Not me, though. I'm on humanity's team.

And in art and entertainment, where novelty and empathy are paramount, I suspect Rosie – or her Apple equivalent, Siri – will always be a second-class citizen.

When I was an undergraduate student, I worked as a personal trainer. When Christmas came, I would always give my clients a free session or two. And some of them would give me Christmas presents. One year, my favorite client gave me the audiobooks for both *The Hobbit* and *The Lord of the Rings*. On CD. Giant cases with, like, 16 CDs. Robert Ingles was the narrator, and I listened to him every night for a couple of years. I hated all the stupid songs, but I was so moved by the personal narration. It felt like someone was tucking me in with a nighttime story.

Today, Audible provides my bedtime reading. But intimate narration remains essential. And I don't suspect the time is coming in which grandma Siri will suffice. I'm willing to relinquish dominion over a *few* acres of human communication, e.g., GPS instructions, personal answering machine messages, and Stephen Hawking. But *Sesame Street*? *The Simpsons*? The adventures of some tiny, hairy, barefooted halflings? I don't think Siri has it in her to captivate me. I need my narrator to express every word in the emotional timbre of conversation. The delivery speeds up and slows down with the excitement of the content. The volume betrays an importance. Added emphasis on particular words offers cues for our attention. The bulk of any joke, lyric, or wedding vow is its delivery. But only because we've all been so conditioned to read deliveries as an adjunct language to the one we're speaking. In this, the *spoken* story works as a two-stringed instrument: it can harmonize in ways the *written* word cannot. But only if we're fluent in it. How do we develop and retain fluency? Through exposure to human society. To the gas attendant. To the grocery clerk. To the bank teller. And countless other could-be-automated roles. If we excise human interaction from our daily lives, we'll gradually become illiterate in the emotional part of language.

I do worry about the amount of exposure the digital generation has to real conversation. Everyone sees it on television, but that feels like a counterfeit of the real thing. And so the future narrators of future audiobooks would be counterfeiting a counterfeit, having scarcely experienced the real thing for themselves. At that point, maybe Siri *would* feel authentic enough to the majority of Audible's customers. But I doubt it. I continue to believe that narrators – along with barbers, barkeeps, and basketball players – would not be easily replaced. Doctors, though. They should have been replaced a long time ago.

Why Hasn't Medicine Already Been Automated?

Much of it has. Other parts have been outsourced. Call centers, for example. I spoke with my mom today. She was in tears, but continued to seek humor in the frustration. "I've already been on the phone for six hours", she told me. Most of that was spent navigating automated systems, trying to reach a human being. "When I finally did get through to someone, I couldn't make out a word she was saying. The accent was difficult, but I was *really* trying, asking her to repeat herself, having her spell things. But the roosters wouldn't stop crowing in the background. I ask her to spell a word and all I hear is cockadoodledooooo!"

Hospitals have no problem eliminating jobs. Some of them to computers. Other jobs go overseas where we can exert financial abuse on impoverished communities. The poorest rung of the workforce is exterminated first. If you've ever been a patient, you know how infuriating it is when human beings don't serve these roles. Because those interactions are not decision trees. There is no button you can press on your touchtone keypad to explain that you got a flat tire on the way to your appointment, but you're still coming, so please don't cancel it when I'm a few minutes late. "Speak to a representative!"

Still, these are the first jobs to go. So the hospital can save a few pennies. "Protecting the workforce" is not a real priority. Protecting the *rich* is the priority. At a great cost: death. Lots of it.

In the end, the American medical system seems best characterized by Dr. Mario. If you're unfamiliar with the 1990 Nintendo game, Mario, wearing a white coat, hurls pills in bulk. Is there any compassion? Is there comprehensive understanding of biology? Is there any motivation to figure out the underlying cause of the problem? No. None of those things. He's just a pill-dispensing machine. And humans, as we all know, are not good machines. *Machines* are good machines. And they're getting better every day. Take video games, for example. We've seen enormous advancements since Mario graduated medical school. If Deep Blue had never been dismantled, it would be remarkably unremarkable today. Compare it to any gaming device made in the last decade, and it would be laughable. So, it's worth wondering: where are the advancements in medicine?